

1. AUTHORITY

The Government Information Technology Agency (GITA) shall develop, implement and maintain a coordinated statewide plan for information technology (A.R.S. § 41-3504(A (1))), including, the formulation of policies to effectuate the purposes of the agency (A.R.S. § 41-3504(A (13))).

2. PURPOSE

Platform Architecture describes common, industry-wide, open-standards-based, interoperable devices, facilitating the reliable and pervasive availability of, access interfaces with, and processing for, the State's distributed information processing environment. It defines various technologies required to facilitate and deliver individual budget units' and the State's business application systems and services to its citizens.

3. SCOPE

This applies to all budget units. Budget unit is defined as a department, commission, board, institution or other agency of the state organization receiving, expending or disbursing state funds or incurring obligations of the state including the board of regents and the state board of directors for community colleges but excluding the universities under the jurisdiction of the board of regents and the community colleges under their respective jurisdictions and the legislative or judicial branches. A.R.S. § 41-3501(2).

The Budget Unit Chief Executive Officer (CEO), working in conjunction with the Budget Unit Chief Information Officer (CIO), shall be responsible for ensuring the effective implementation of Statewide Information Technology Policies, Standards, and Procedures (PSPs) within each budget unit.

4. POLICY

Budget units shall utilize Platform Architecture target technologies¹, methodologies, standards, and best practices to develop, implement, and/or acquire computer systems.

4.1. Platform Architecture addresses platform devices relative to their: versatility, capability to seamlessly interoperate with other platform devices, operating systems, embedded security, adherence to open or pervasive industry standards, provision for open system standard interfaces, and utilization of open standard drivers. This approach aligns with *Statewide Policy P100, Information*

¹ The Arizona *Target Technology Table* is available at: http://gita.state.az.us/enterprise_architecture/.

Technology, by focusing on the functionality of platform technologies to support budget unit business requirements that enhance budget unit services and operational capacities, improve productivity, performance, and public services rather than addressing attributes such as specific platform configurations, explicit devices, and operating system revisions that neither provide a direction for current and future activities nor directly relate to the State's business functions.

4.2. PLATFORM ARCHITECTURE CATEGORIES

Categories of the Platform Architecture range from enterprise-class mainframe-servers to individual workstations and hand-held computing devices along with the operating systems that control these devices. Platform categories, or tiers, complement each other and maximize the operation and usefulness of various specialized platform devices to address budget unit business requirements.

Platform Architecture categories include the following:

- Server. The server with its associated operating system provides services requested by clients. Types of servers included are: mainframes, midrange, and network servers (application, file, print, database, etc.). Servers should be positioned to embrace a variety of applications so that, over time, as open-standard operating systems and open-standard interfaces are deployed, the traditional boundary lines between voice, data, and video are eliminated. Server-attached, or network-attached output devices such as printers, plotters, etc., should use IEEE-standard interfaces and industry de facto standard software drivers.
- Storage. Storage is increasingly recognized as a distinct resource, one that is best thought of separately from the devices (servers, clients) that are its consumers and beneficiaries. Such storage is increasingly often shared by multiple servers/clients, and acquired and managed independently from them. Storage solutions should address the State's requirements for short term, long term, and permanent storage of information. Types of storage include:
 - Direct Attached Storage (DAS) is comprised of interfaces (controllers) and storage devices that attach directly to a server or a client. DAS, in the form of independent storage devices, RAID arrays, or tape libraries, is the most common storage architecture today.
 - Network Attached Storage (NAS) is an open-industry-standard, file-oriented, storage implementation where storage devices are connected to a network and provide file access services to server and client devices. A NAS storage element consists of an engine, which implements the file services, and one or more devices, on which data is stored. By connecting directly into a network, NAS technologies allow users to access and share data without impacting application servers.
 - Storage Area Network (SAN) is an open-industry-standard, data-centric, storage implementation that traditionally uses a special-purpose network that incorporates high-performance communication and interface technologies as a means to connect storage devices with servers.

- Client. The client, with its associated operating system, provides the end-user interface to the business application. Clients include the personal computer (PC), thin client, host-controlled devices (terminals, telephones, etc.), voice interface devices, single- and multi-function mobile devices (Pocket PC, PDA, PDA-phone, etc.), telephony devices, smart cards, etc. “Personal” input devices (tablet, keyboard, probe, etc.) and output devices (monitors, displays, projectors, speakers, printers, etc.) attached to a client device should use IEEE-standard interfaces and industry de facto standard software drivers.

4.3. TARGET PLATFORM ARCHITECTURE ASSESMENT

Attachment A, Target Platform Architecture Assessment, expands upon the categories summarized below to establish the methodology for determining an budget unit’s platform technology position. The assessment demonstrates *Statewide Policy P100, Information Technology*, through the incorporation of the underlying principles, standards, and best practices of the Target Platform Architecture.

Target Platform Architecture Assessment Summary

Device Category	Description
1. Versatility	Provides flexibility, adaptability, and scalability without substantial modification
2. Operating Systems	Utilizes open- or pervasive-industry-standard operating systems
3. Operating Systems Security	Addresses the security functionality of Operating Systems
4. Open Standard Interfaces and Drivers	Adhere to open-system-standard interface specifications and utilize device drivers with IEEE interfacing and industry de facto standard protocols and formats

4.4. PLATFORM ARCHITECTURE GENERAL PRINCIPLES

The planning, design, and development of Platform Architecture are guided by the following general principles that support the State’s strategic business goals and objectives.

- 4.4.1. Platform Architecture provides the device infrastructure to support State and budget unit business and administrative processes.
- 4.4.2. Servers and storage that support essential business processes and mission-critical business operations shall be operational, reliable, and available 24x7x365.
- 4.4.3. Platforms shall use industry-proven, mainstream technologies based on pervasive industry-wide, open interfaces, and open architecture.
- 4.4.4. Platform operating system security should be based on industry-wide, open standards.
- 4.4.5. Platform configurations and associated operating system versions should be minimized.

- 4.4.6. Platform infrastructure should employ open, industry-standard components, using an n-tier model.
- 4.4.7. Platform infrastructure should be designed for growth, flexibility, and adaptability.
- 4.4.8. Platform infrastructure should maximize the design and availability of Target Network Architecture for delivery of applications and services to citizens and end-users, regardless of location.

Supporting rationale for the above principles can be found in the *Target Platform Architecture* document available at http://gita.state.az.us/enterprise_architecture.

4.5. PLATFORM ARCHITECTURE TARGET TECHNOLOGIES

Components of the Target Platform Architecture are reviewed and refreshed on a regular and scheduled basis to address major shifts in technology, as well as the emergence and adoption of new technology-related industry or open standards. Review criteria shall adhere to the lifecycle process described in *Statewide Policy P700, Enterprise Architecture*.

4.6. PLATFORM ARCHITECTURE STANDARDS

Platform Architecture Standards describe client and server devices along with storage platforms, operating systems, and open system interfaces that provide for interoperability [the capability for services (applications) operating on different, diverse devices to exchange information and function cooperatively using this information], and portability (the capability of software to operate and perform in the same manner on different types of devices) of business application systems. Refer to Statewide Standard P720-S720, Platform Infrastructure, for further information.

4.7. IMPLEMENTATION

Arizona's EWTA has been designed to maximize current investments in technology, provide a workable transition path to targeted technologies, maintain flexibility, and to enhance interoperability and sharing. Platform Architecture implementations shall adhere to implementation strategies described in *Statewide Policy P700, Enterprise Architecture*.

Platform Architecture shall be implemented in accordance with *Statewide Policy P800, IT Security*, and applicable Statewide Standards for Security.

4.8. CONFORMANCE OF IT INVESTMENTS AND PROJECTS TO EA

To achieve the benefits of an enterprise-standards-based architecture, all information technology investments shall conform to the established EWTA that is designed to ensure the integrity and interoperability of information technologies for budget units. *Statewide Standard P340-S340, Project Investment Justification (PIJ)*, defines conformance with the established EWTA and associated Statewide Policies and Standards. Variances from the established EWTA shall be documented and justified in the appropriate section of the PIJ document.

4.9. APPLICABILITY TO OTHER STATEWIDE EA POLICIES AND STANDARDS

Statewide Policy P720, Platform Architecture, adheres to and demonstrates the purpose established in *Statewide Policy P100, Information Technology*.

Statewide Policy P720, Platform Architecture, adheres to the principles, governance, lifecycle process, and implementation elements described in *Statewide Policy P700, Enterprise Architecture*.

5. DEFINITIONS AND ABBREVIATIONS

Refer to the Glossary of Terms located on the GITA website at http://www.gita.state.az.us/policies_standards for definitions and abbreviations.

6. REFERENCES

- 6.1. A. R. S. § 41-621 et seq., "Purchase of Insurance; coverage; limitations, exclusions; definitions."
- 6.2. A. R. S. § 41-1335 ((A (6 & 7))), "State Agency Information."
- 6.3. A. R. S. § 41-1339 (A), "Depository of State Archives."
- 6.4. A. R. S. § 41-1461, "Definitions."
- 6.5. A. R. S. § 41-1463, "Discrimination; unlawful practices; definition."
- 6.6. A. R. S. § 41-1492 et seq., "Prohibition of Discrimination by Public Entities."
- 6.7. A. R. S. § 41-2501 et seq., "Arizona Procurement Codes, Applicability."
- 6.8. A. R. S. § 41-3501, "Definitions."
- 6.9. A. R. S. § 41-3504, "Powers and Duties of the Agency."
- 6.10. A. R. S. § 41-3521, "Information Technology Authorization Committee; members; terms; duties; compensation; definition."
- 6.11. A. R. S. § 44-7041, "Governmental Electronic Records."
- 6.12. Arizona Administrative Code, Title 2, Chapter 7, "Department of Administration Finance Division, Purchasing Office."
- 6.13. Arizona Administrative Code, Title 2, Chapter 10, "Department of Administration Risk Management Section."
- 6.14. Arizona Administrative Code, Title 2, Chapter 18, "Government Information Technology Agency."
- 6.15. State of Arizona Target Platform Architecture.
- 6.16. Statewide Policy P100, Information Technology.
- 6.17. Statewide Policy P340, Project Investment Justification (PIJ).
 - 6.17.1 Statewide Standard P340-S340, Project Investment Justification (PIJ).
- 6.18. Statewide Policy P700, Enterprise Architecture.
- 6.19. Statewide Policy P800, IT Security.
- 6.20. Statewide Standard P720-S720, Platform Infrastructure.

7. ATTACHMENTS

- A. Target Platform Architecture Assessment.

ATTACHMENT A. TARGET PLATFORM ARCHITECTURE ASSESSMENT.

This assessment is designed to support the planning and implementation of Target Platform Architecture recommended standards and best practices. The assessment applies to EA Gap Analysis and to IT projects that include business requirements that propose or require modifications and/or additions to existing deployments of platform devices.

Platform Device Name/Description:

Category	Max. Possible	Score	Category Description
1. Versatility	8		Provides flexibility, adaptability, and scalability without requiring substantial modification.
2. Operating Systems	6		Utilizes open- or pervasive-industry-standard, secure, operating systems.
3. Operating Systems Security	7		Addresses the security functionality of Operating Systems.
4. Open Standard Interfaces & Drivers	4		Adheres to open-system-standard interface specifications and utilizes device drivers with IEEE interfacing and industry de facto standard protocols and formats.
Total Rating Points	25		

1. Versatility refers to a device's capability (assuming connectivity where applicable) to provide interoperability, flexibility, adaptability, and scalability without requiring substantial modification.

Score 1 Rating Point for a "Yes" answer	Yes
1. Is the device capable of delivering applicable EA Target standards without major upgrades and additional costs?	
2. Is the device capable of delivering or providing secure (as defined by the AZ EA Target Security Architecture) end-user interface access to a variety of business applications (HRIS, email, office productivity applications, Internet, telephony, voice mail, etc.) without substantial modifications, regardless of end-user location?	
3. Is the device capable of delivering or providing end-user interface access to a variety of business applications maximizing a fully converged network, regardless of end-user location?	
4a. Server only – is the device capable of hosting or delivering multiple, and varied application solutions, with sufficient reliability, redundancy, and fault tolerance to support essential agency business operations?	
4b. Storage only – is the device capable of hosting or delivering storage for multiple, and varied application solutions, with sufficient reliability, redundancy, and fault tolerance to support essential agency business operations?	
4c. Client only – is the device capable of providing one common point for end-user connectivity access and productivity for multiple and varied application solutions?	
5. Is the device able to maximize the use of the EA Target Network Architecture standards?	
6. Is the device capable of accommodating increased demands for service and new application solutions without substantial modifications?	
7. Are widespread choices for off-the-shelf application solutions, without modifications, available for this device?	
8. Does the versatility of this device directly improve the quality and timeliness of agency business functions?	
Total Rating Points	

2. Operating Systems refer to a device's, or networks, capability to utilize open- or pervasive-industry-standard operating systems.

Score 1 Rating Point for a "Yes" answer	Yes
1. Is an open-industry-standard operating system currently available for this device?	
2. Is the operating system currently deployed with this device an open or industry de facto standard operating system?	
3. Does the operating system currently deployed with this device allow for all updates to be pushed to, or accepted by, all associated devices?	
4. Is the same version of the operating system currently deployed with this device available for all similar devices offered by the manufacturer?	
5. Is the installed version of the operating system currently deployed with this device the most current production version, or no more than one major revision behind the most current available?	
6. Is the operating system currently deployed with this device scheduled for future production releases?	
Total Rating Points	

3. Operating Systems Security refers to a security functionality that is available with the Operating System (must be answered relative to responses in 2. Operating Systems.)

Score 1 Rating Point for a "Yes" answer	Yes
1. Do the operating system security services align with the AZ EA Target Security Architecture?	
2. Does the operating system security allow for logging and the security controls for applications, platform, and network levels to be integrated to reduce and eliminate redundancies?	
3. Does the operating system support access, authentication, and authorization techniques as defined in the AZ EA Target Security Architecture and related standards?	
4. Does the operating system allow for an integrated LDAP directory service?	
5. Does the operating system allow for all security updates to be pushed to, or accepted by, all associated devices?	
6. Does the operating system allow for logging and the restriction, including preventing end-user override, of particular functions or services, such as non-essential or redundant services, communication options that are susceptible or prone to abuse, and operating-system-level utilities?	
7. Can extraneous services, open ports, etc., be easily removed from "default installations of the operating system" and prevented from returning when the operating system is upgraded?	
Total Rating Points	

4. Open Standard Interfaces and Drivers refer to a device's capability to adhere to open-system-standard interface specifications and to utilize device drivers that use IEEE and industry de facto standard protocols and formats.

Score 1 Rating Point for a "Yes" answer	Yes
1. Does the device utilize target network standards for communication protocols?	
2. Is the device capable of being configured, managed, and maintained using standard SNMP-based management tools?	
3. Is the device capable of utilizing open-standard drivers that employ IEEE-interfaces and industry de facto standard software drivers?	
4. Are multiple, off-the-shelf, peripheral devices that conform to open-system-standards and that utilize industry de facto standard drivers available for this device?	
Total Rating Points	

Score. Questions for the four (4) platform device categories are scored with one (1) point for a "Yes" answer, and zero (0) for a "No" answer. Maximum possible is the total number of questions for each category.

Definitions:

Applicable is defined as pertinent, related to, relevant, and appropriate.

Capability is the potential and ability for development or use. It is the capacity to be used or developed for a purpose.

Device includes logical groupings or categories of server, storage, and client platforms in use statewide, or within an agency.

Maximize is defined as taking full advantage of the subject attribute(s).

Variety is defined simply as more than one. Note: the intent of versatility is to maximize flexibility and usefulness of a device relative to the applicable agency business applications.

Widespread is defined as extensive and prevalent.